

Water Sample Concentrator

Filling a critical need for water quality sampling methods

The Water Sample Concentrator (WSC) developed by INL and the U.S. EPA (Cincinnati) fills a critical need for water quality sampling methods that non-specialists can use to monitor water resources. When used in conjunction with a network of qualified water analysis laboratories, the Water Sample Concentrator can empower communities with the information they need to become safer, healthier, and more self-sustaining.

A growing number of people in the world are forced to drink daily from contaminated water

sources that make them sick. Chronic lack of access to safe water, the most basic of human needs, results in deterioration of the general physical condition and increases poverty because of high medical costs for treatment, and the loss of working days that occur as a result of waterborne diseases. Increasing demand for water to be used for human consumption, diminishing safe water supplies, and the threat of intentional contamination to community water resources make water quality monitoring a top priority for the preservation of communities large and small.

The Water Sample Concentrator automates laboratory sample concentration processes and makes them portable, so that they can be performed reliably in the field at a fraction of the cost of previous water quality collection and transport methods.

Key innovations and advantages of the Water Sample Concentrator include:

- **Saves time** – Integrates sample collection and concentration processes, reducing

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The WSC automates laboratory sample concentration and packaging processes and makes them field portable so that nonspecialists can perform them at the site of sample collection.



The WSC reduces the water sample volume from 100 liters (~220 lb) to 250 ml (~1/2 lb) and packages it for transport to a qualified analytical laboratory.

The Energy of Innovation

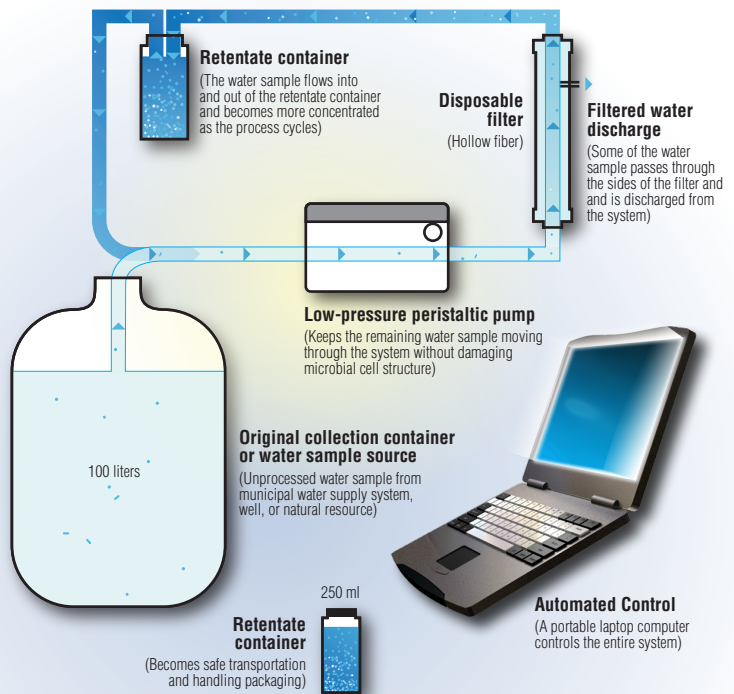
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the time it takes to determine pathogen content and population. One hundred liters of water sample can be processed and concentrated in about an hour.

- **Reduces costs** – Capital equipment and disposable, one-time-use sample kits are inexpensive, and portability to the sampling site drastically reduces the sample volume that has to be transported and processed.

- **Saves labor and adds convenience** – Physical handling of reduced volumes minimizes strain on those who are collecting and handling the samples. Multiple field sampling only requires the installation of a new disposable sample kit, which takes just minutes. Once the sample concentration process has begun, no operator interaction is required until the Water Sample Concentrator automatically shuts down after the processing is complete.

- **Improves accuracy and consistency** – Concentrating fluid samples assures highly diluted pathogens will be identified, and automating processes that traditionally have been performed manually in the laboratory improves consistency between samples.
- **Provides turnkey operation** – Instrumentation/controls allow operation with minimal set up and training.
- **Provides real-time status monitoring** – Computer screen provides a virtual display of the filtration



The process flow schematic of the WSC--concentrated samples can be analyzed for a variety of pathogens, including viruses, bacteria, bacterial spores, protozoa, and some large molecular weight toxins.

process, allowing operators to monitor the status and respond quickly if there are operational problems or adjustments need to be made.

- **Incorporates safety features** – Hands-free operation and bio containment assure operators and handlers are not exposed to toxic concentrations of pathogens. Parts of the system that come in contact with the concentrated sample can be removed in one piece, bagged, and used as forensic evidence.
- **Ensures sample integrity** – Samples do not come in contact with the interior of the pump. Equipment pieces that do come in contact with the sample are inexpensive and disposable. The system has been designed to eliminate cross contamination when taking multiple samples.

- **Assures environmental safety** – Returns only clean water to the environment. Most parts, other than the sample kit, can be quickly and easily decontaminated for reuse.

The Water Sample Concentrator revolutionizes the way water sampling is performed and extends water monitoring capabilities to a larger population than any previous technology. Having the system in place will not only assure that more routine water quality monitoring occurs, but in the event of a water safety crisis, the system also will help in assessing water quality, saving lives, and allowing a more rapid restoration of normalcy. People of the world require safe drinking water to live. The Water Sample Concentrator delivers faster, safer testing of water to safeguard them.

For more information

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